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E70 Introduction Workbook

Subject Page

Initial Print Date: 12/06 Revision Date:

Introduction

Model: E70

Production: From Start of Production

OBJECTIVES

After completion of this module you will be able to:

- Compare the E70 with the E53
- Describe changes on the E70
- Understand Basic Features of the E70

The New E70

Since the first X5 SAV, the world has been anxiously awaiting the successor to the E53. The E70 marks the second generation of the X5 and includes many new features and functions which were not available in the previous X5.

As one would expect, the new E70 raises the standard for the SAV driving experience. The propulsion for the new SAV is provided by new 6-cylinder and V-8 engines with more performance than the previous power units.

Since the introduction of the original X5 (E53), there have been more than 580,000 units produced, half of which (240,000) have been sold in the U.S. market.

The new X5 continues the tradition of a luxury appointed, premium SAV. The E70 interior combines sophisticated materials with innovative options and class leading technology.

The overall ground clearance has been increased and there is a new front suspension to complement the BMW patented integral lV rear suspension.

The BMW active steering system has been added for the first time on a X-drive equipped vehicle. There is also an optional “Adaptive Drive” package which combines Active Roll Stabilization (ARS) and Electronic Damping Control (EDC) for improved ride quality and handling.

The new EDC system features the world debut of FlexRay, a new high speed data transmission system developed with the leadership of BMW and a major consortium of development companies.

The highlights of the new E70 X5 include:

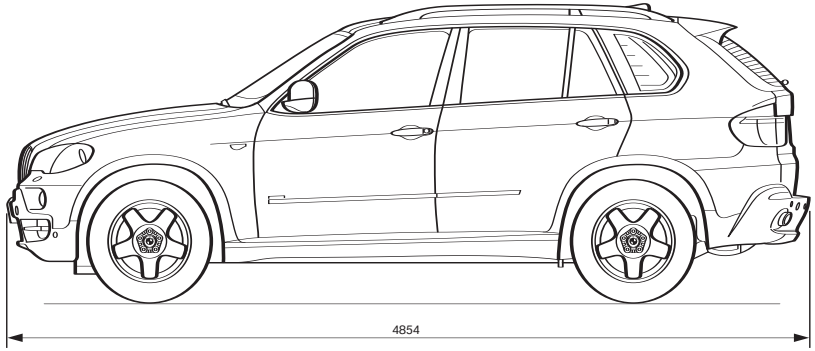
- Weight optimized body shell with improved torsional stiffness
- Standard Run-flat tires
- Active Steering
- Adaptive Drive package (EDC and ARS)
- New 6-speed gearbox with electronic gear selector
- Full time AWD - X-drive technology
- Improved power and efficiency with new engines
- Larger interior with 3rd row seating (up to 7 seats)
- Optional Head-up display
- New i-Drive control concept with six programmable keys
- Exclusive interior with innovative options
- Improved handling and driving dynamics

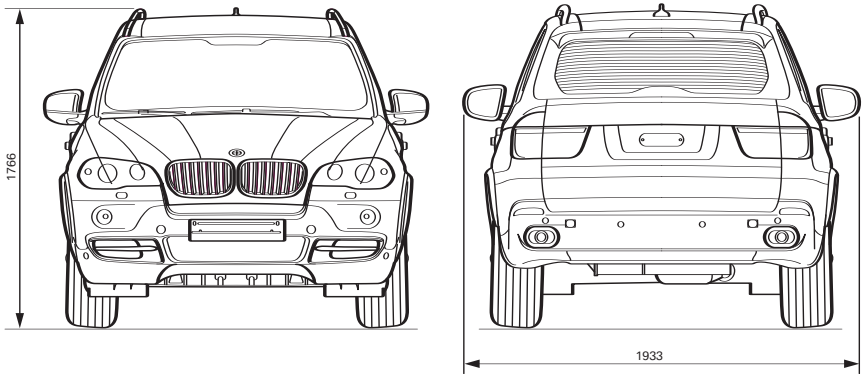
Technical Comparison (E53 vs E70)

The E70 represents a logical progression from the E53. Overall, in comparison with the E53, the E70 is larger in all dimensions. As you can see from the chart below, the E70 is longer, wider and taller than it's predecessor.

Most notably, the wheelbase has increased significantly and the weight has been increased by only 30 kilograms.

Specification	E70	E53
Unladen weight (kg)	2,125	2,095
Length (mm)	4,854	4,667
Width (mm)	2,197	2,180
Height (mm)	1,766	1,707
Wheelbase (mm)	2,933	2,820
Track width, front (mm)	1,644	1,576
Track width, rear (mm)	2,933	2,820





Although, the E70 is larger and heavier, the handling, agility and ride quality are not affected. In fact, the new chassis systems and adaptive ride packages only enhance the driving experience on the E70.

Overall interior room is improved and with the optional 3rd row seat, up to seven passengers can be accommodated.

Workshop Exercise - External Walkaround

Using the training vehicle, inspect and view the overall vehicle exterior and answer the questions below:

Fill in the chart below regarding the external body materials:

Body Component	Material
Hood	
Fenders	
Doors	

What type of tires are used on the E70? _____

Are run-flat tires standard or optional on the E70?

_____

Fill in the blank below with the correct answer regarding the overall dimensions on the E70:

The overall length the the E70 is _____ mm _____ than the E53.

The unladen weight of the E70 is _____ kg. _____ than the E53.

The wheelbase of the E70 is _____ mm _____ than the E53.

The overall height of the E70 is _____ mm _____ than the E53.

Pedestrian Protection

In Europe and Asian markets, new requirements are in place to protect pedestrians in the event of an impact with a vehicle.

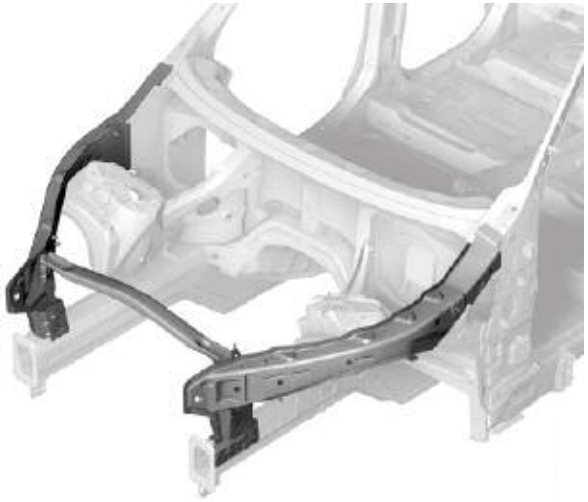
Currently in the U.S. there are no regulations regarding the protection of pedestrians. However, BMW has introduced one of the first SAV's to include such measures.

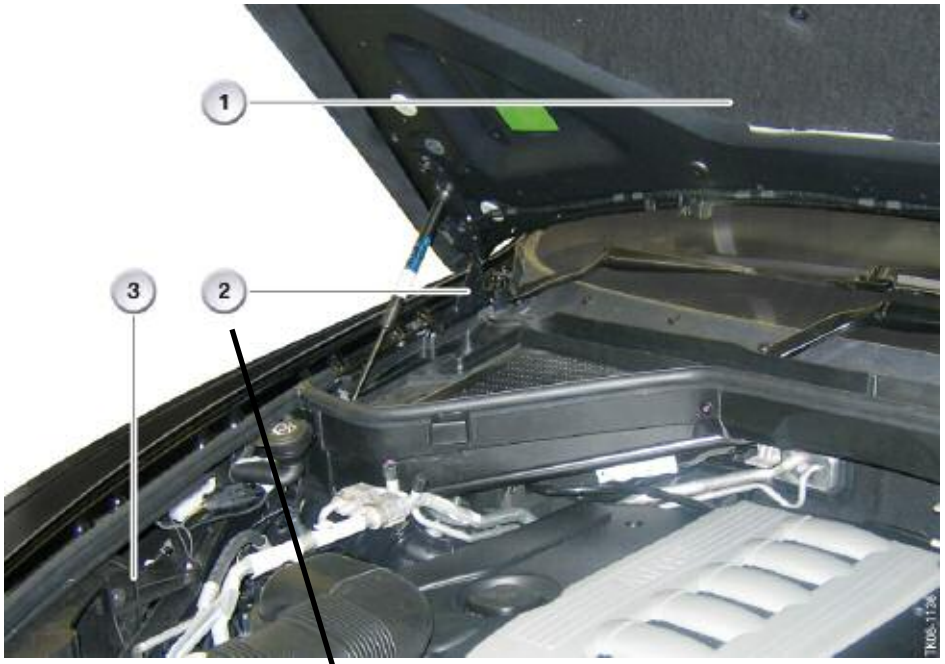
The front end of the E70 has been modified to reduce impact forces in the event of a collision with a pedestrian.

These measures include:

- The hood is an aluminum design which will flex in an impact reducing potential head injuries
- The hood hinges have a disengaging mechanism which allows for downward hood movement at the rear
- The fender are made from thermoplastic and are mounted on a plastic "lattice" frame which also flexes on impact.

The front frame rails are also modified (curved inward) in order to be compatible with the pedestrian protection system.





Index	Explanation	Index	Explanation
1	Hood	3	Side panel module
2	Hood Hinge		

Additionally, the air filter housings on both engines (N62KP and N62TU) have been modified to comply with pedestrian protection requirements.

Side Panel Module

The side panel module consists of the plastic side panel (fender) and the plastic module carrier.

In addition, the side panel module also contains the washer tank, the front headlight, the fog lamp, the auxiliary turn signal light, the wheel arch cover and the wheel arch finisher.

Alignment of the Side Panel with the Hood

The eccentric cam sets the position of the side panel between the side panel and the module carrier.

Changing the Light Source

The light source of the front headlight is changed through the engine compartment. To do this, insert your hand between the ribs of the module carrier and remove the cover from the headlight housing.

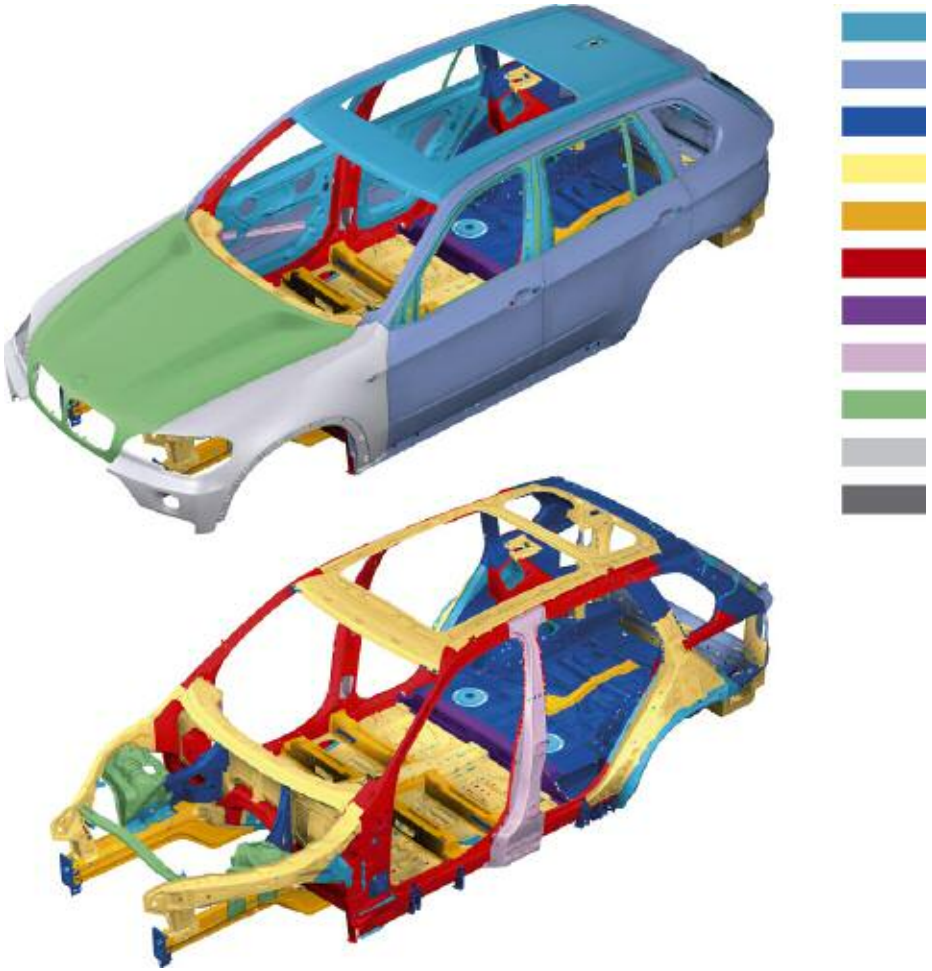
The light source of the fog light is changed by first removing the side grill on the decorative strip. Through these openings, you can now reach in to change the light source.

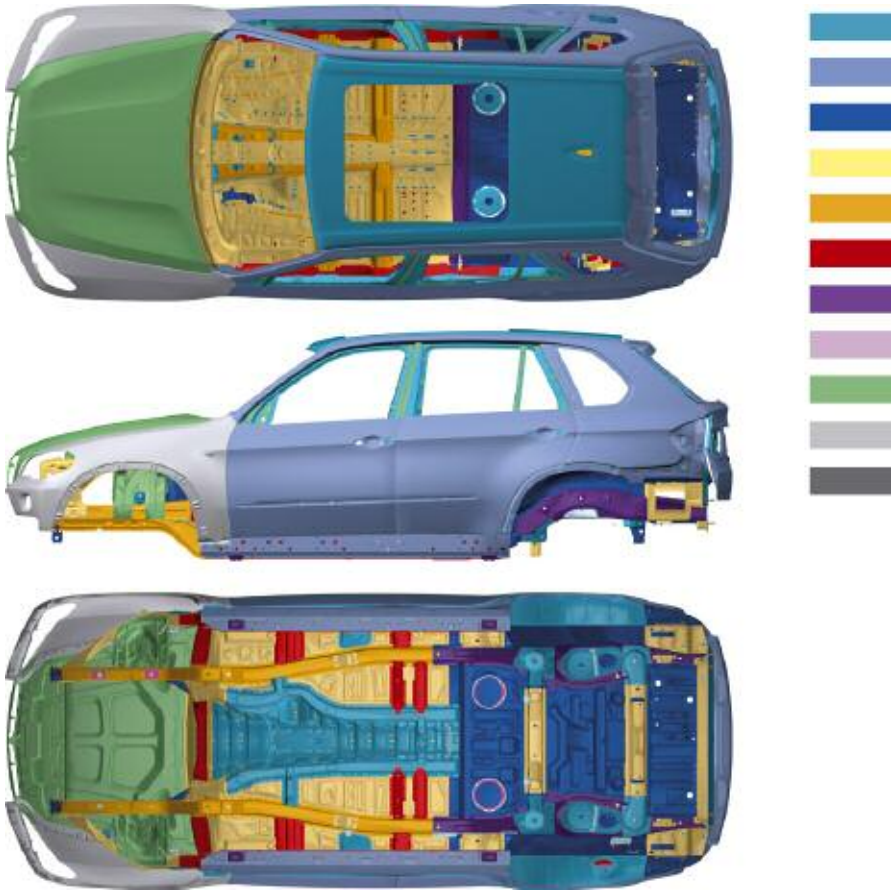
Index	Explanation	Index	Explanation
1	Auxiliary turn signal	5	Front headlight
2	Washer tank	6	Front fog lamp
3	Module carrier	7	Washer pump
4	Side panel module support		

Body Construction

As usual, BMW has improved the E70 in many areas. Not the least of which are in the body construction. The overall rigidity has been improved to 27,000 Nm per degree in the E70. This is a considerable increase over the E53 at 23,500 Nm per degree.

This is accomplished with the use of high strength steels. Some of the areas improved include the b-pillar, front end and rear end.





The various colors in the above illustrations show the variety and mix of materials used on the E70. These materials are advanced steels which are used according to the requirements such as strength, weight and thickness.

The use of advanced steels and processes have allowed the E70 to achieve a 5 star rating on the NCAP crash test.

For additional information on the body construction, refer to the “Introduction” section of the E70 reference material which can be found on TIS and ICP.

Strut Towers

As you may already know, the E60 was the first vehicle to use the GRAV front end which is almost entirely aluminum. In contrast, the E70 only uses aluminum on the hood and the strut towers.

The strut towers are made from cast aluminum and riveted to the the vehicle with special rivets as on the E60.

The cast aluminum spring support (strut tower) of the E70 is distinguished primarily by the following features:

- Lower weight through intelligent lightweight construction
- Improved driving dynamics through increased rigidity
- Fewer components and thus lower production costs.

With the E70 a cast aluminum spring support has been used in the front end, for the first time in the X-series.

The cast aluminum spring support absorbs the chassis forces and directs them to the body.

Both the spring strut and the upper transverse link are attached to the spring support. This requires the component to be extremely rigid. This rigidity is achieved through improved material distribution, by only clustering material where it is necessary.

The spring support thus makes a significant contribution to the driving characteristics, as it supports static and dynamic wheel forces.

Since the casting construction method makes it possible to integrate many individual functions and components into a single part, this design is significantly more compact than the conventional shell-type design and helps reduce the weight.

- Weight reduction of approximately 50% through lightweight construction using cast aluminum compared with conventional sheet metal design
- Extra space compared with conventional sheet metal construction: 80 mm shorter front end
- Functional design through specific local reinforcements; contribution to lightweight construction; robustness of the construction
- Integration of various brackets for mounting assemblies, etc. in the component.

Workshop Exercise - Vehicle Walkaround

Open the rear hatch and note the operation of the upper and lower gate.

In comparison to the E53, how is the lower gate opened on the E70?

Take a look at the upper gate and note the position/operation of the emergency tailgate release.

Locate and note the adjustment points for the upper and lower hatch.

Are there any special tools required for the lower gate adjustment shown above?

Which adjustment should be performed first? Upper or lower gate

The adjustment point shown above is for:

_____

_____

What tool is used for this?

_____

_____

Proceed with checking the upper hatch adjustment.

Does the E70 have “soft close” on the tailgate lid?

_____

_____

Workshop Exercise - Vehicle Walkaround

In the rear hatch area, look over the storage options and check over the various component locations.

If possible, check a vehicle with 3rd row seating and compare the storage options and equipment to a vehicle equipped with only 2nd row seating .

Locate the vehicle tool kit and note contents:

What is the “hex key” tool used for?

In the tool kit, there is a red “hammer like” tool, what are the two uses for this tool?

Locate the EMF emergency release location and use tool to release parking brake?

Find the following components and note locations:

Component	Location
Battery	
Rear Distribution box (on battery)	
Spare tire	
SDARS	
HiFi Amplifier	
TCU	
Fuel Pump Module (EKP) N52	
MOST bus junction point	
Rear Power Distribution box	
Comfort Access Module	
Vertical Dynamics Module (VDM)	

Workshop Exercise - Vehicle Walkaround

Open hood and note hood release operation. Examine under-hood components and note the following items:

- ❑ *Engine Oil Fill*
- ❑ *Dipstick (N62)*
- ❑ *Washer Fluid Fill*
- ❑ *Power Steering Fill*
- ❑ *Brake Fluid Fill (Master Cylinder)*
- ❑ *E-Box Access*
- ❑ *A/C High and Low Pressure Ports*
- ❑ *Microfilter Access*
- ❑ *A/C Ambient (Outside) Temp Sensor*
- ❑ *Air Filter Replacement*
- ❑ *Fender Adjustment Points*
- ❑ *Headlight Bulb Access*
- ❑ *DSC Control Unit*
- ❑ *Oil Filter Location (N52 and N62)*
- ❑ *Battery Junction Locations*
- ❑ *Coolant Fill*

Workshop Exercise - Exterior Lighting

Operate all of the exterior lighting features as shown in the chart below and complete the chart by checking off the bulbs which are illuminated by these functions:

	Low Beam (Bi-Xenon)	High Beam (Bi-Xenon)	Corona Rings (Parking light)	Marker /Directional (parking light)	Interior Lights	Courtesy Lights	Fog Light Cornering light	Tail light	Back-up light (Reverse)	License plate light
Welcome lights										
Parking Lights (Side Lights)										
Low Beams										
High Beams										
Flash-to-pass										
Adaptive Mode (Block RLSS)										
Daytime Driving Lights										
Cornering (turn) Lights										
Fog Lights										
Back-up Lights										

Fill in the chart below regarding the front lighting.

Index	Explanation/function
1	
2	
3	
4	

Which control module is primarily responsible for the exterior lighting on the E70?

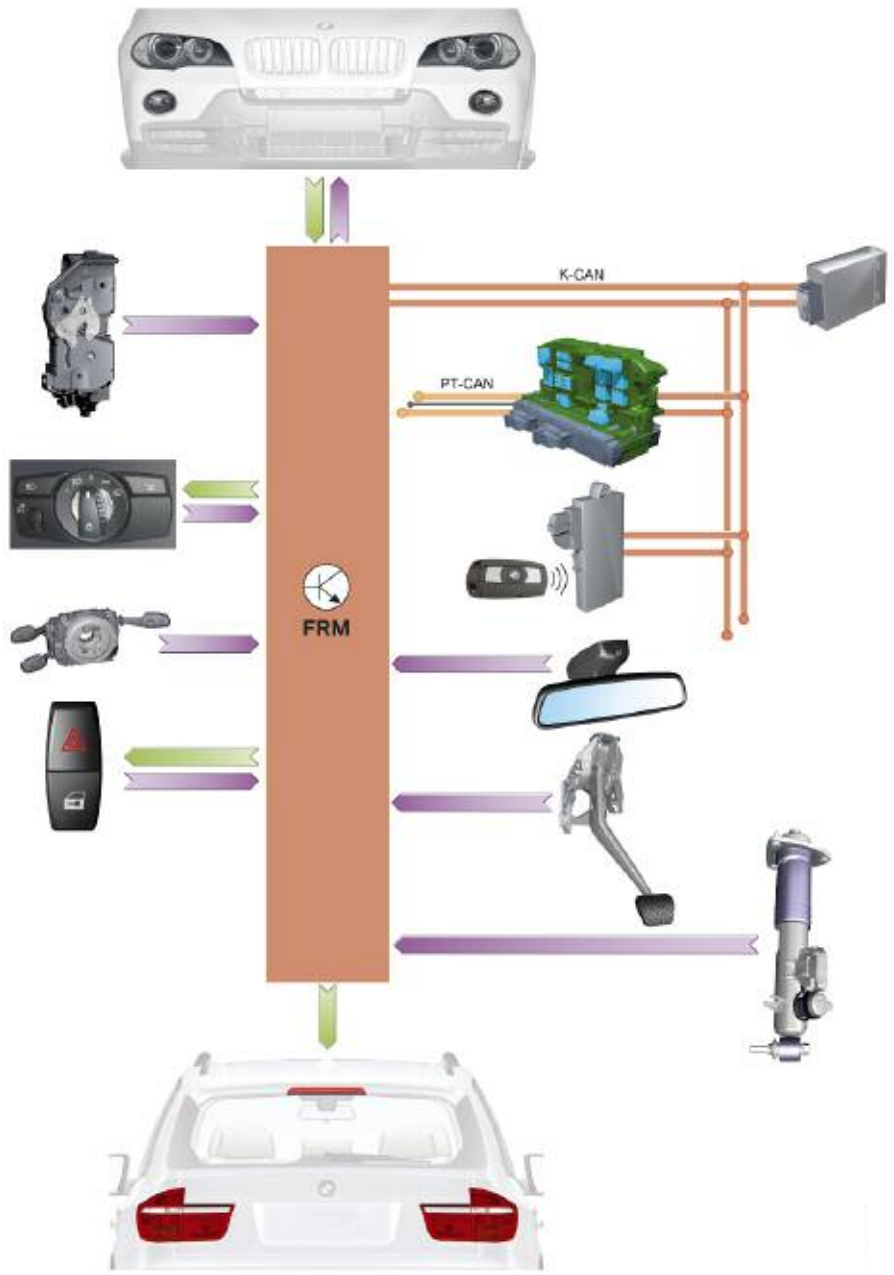
Workshop Exercise - Vehicle Lighting

How are the “daytime driving lights” activated?

What’s new about the Rain Sensor?

Under what conditions do the “welcome lights” come on?

Under what conditions does the “cornering light” come on?



Vehicle Seating

The new E70 features some new seating arrangements which were not previously available on the E53.

In addition to the front driver and passenger seating, there is a 2nd row seating configuration which is standard.

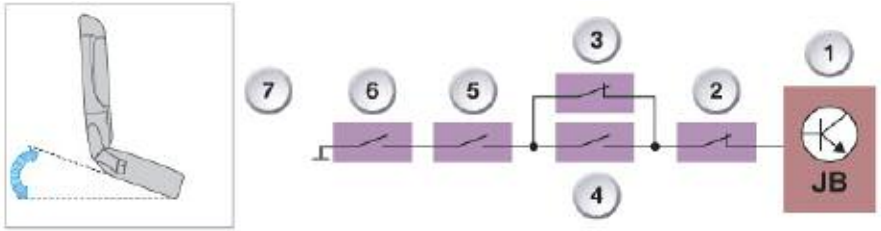
In order to access the third row of seats, the 2nd row slides forward and tilts to facilitate entry and exit from the vehicle. To prevent the possibility of the driving with the 2nd row seats unlocked, there are a series of microswitches which will trigger a warning gong and check control message.

The microswitches are an input to the JB. There are several microswitches connected in series. If any of the switches are open, a check control message and gong will be initiated.

There is also an optional 3rd row seating package. This option not only comes with the 3rd row of seats, but also a 3rd row heating and ventilation package.

On vehicles with the 3rd row seating option, there is no spare tire available. The vehicle is already equipped with run-flat tires as a standard feature.

On vehicles with 2nd row seating only, the vehicle has a standard spare (space saver) with jack.



Glovebox

A new feature in the E70 is a glovebox with a lid split into two sections. The two-section lid can be electrically unlocked at the touch of a button. After being unlocked, the lids are automatically opened by spring force.

Activation is triggered by a button. The button is located below the center air vent in the instrument panel. To close, it is sufficient to press one lid only in the "CLOSED" direction.

The other lid is automatically closed in the same process. The lids snap into place in the lock in the "CLOSED" end position.

Depending on the vehicle order, a CD changer or DVD changer can be installed in the glovebox.

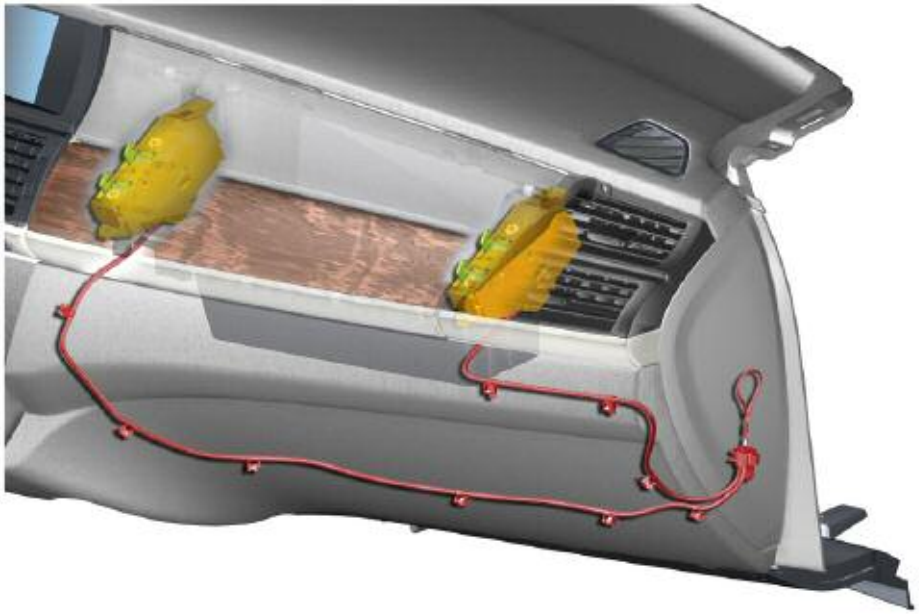
Emergency Unlocking of Glovebox

An emergency unlocking mechanism is provided so that the glovebox can be opened when the vehicle is de-energized or in the event of faulty unlocking mechanisms.

The emergency unlocking mechanism can be accessed from the front passenger's side.

Only the instrument-panel cover needs to be opened here. Behind this cover is a loop, which, when pulled, unlocks and opens the glovebox.

The color of the system components shown here has been changed so that the emergency unlocking mechanism can be recognized more easily. Glovebox can be opened even when the vehicle is de-energized!



Walk Around Summary

After the vehicle walk around and overview of topics in the section. Check and make sure you can answer the following questions:

- ❑ What are the basic dimensional changes on the E70?
- ❑ What are the materials used on the hood and fenders etc.?
- ❑ Do you understand the basic rear hatch adjustments?
- ❑ What are the components/systems involved in the “Pedestrian Protection System?
- ❑ Can you locate and identify the components which are accessible in the rear hatch area?
- ❑ Do you understand the 2nd and 3rd row seat operation and configuration?
- ❑ Do you understand the exterior lighting features on the E70?
- ❑ How is the EMF released in the event of an emergency?
- ❑ Can you locate the vehicles fuses (front and rear)?
- ❑ How is the emergency glovebox release accessed?
- ❑ How is the JB accessed?
- ❑ Can you locate all of the important “under hood” items? (fluid fill/B+ junctions etc.)
- ❑ How are the front headlight bulbs accessed?